

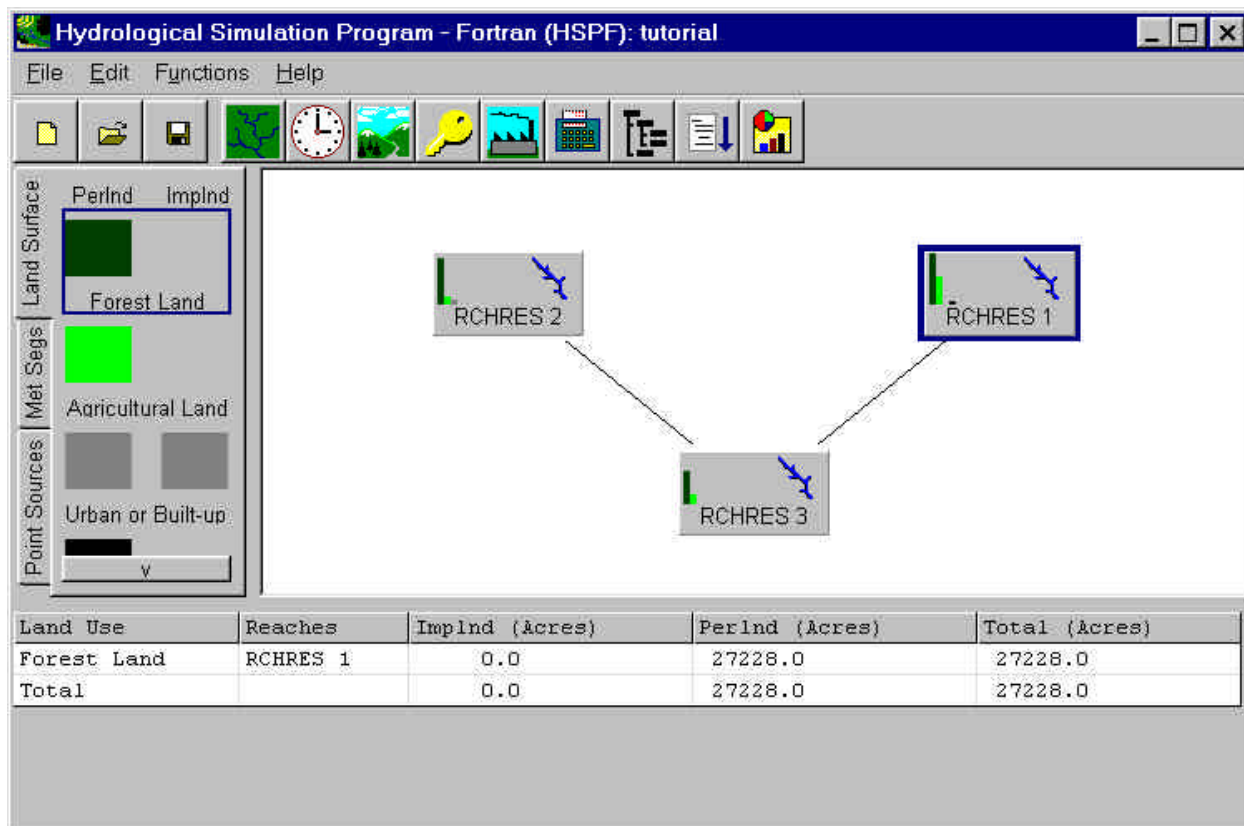
## Detailed Functions

### Main WinHSPF Window

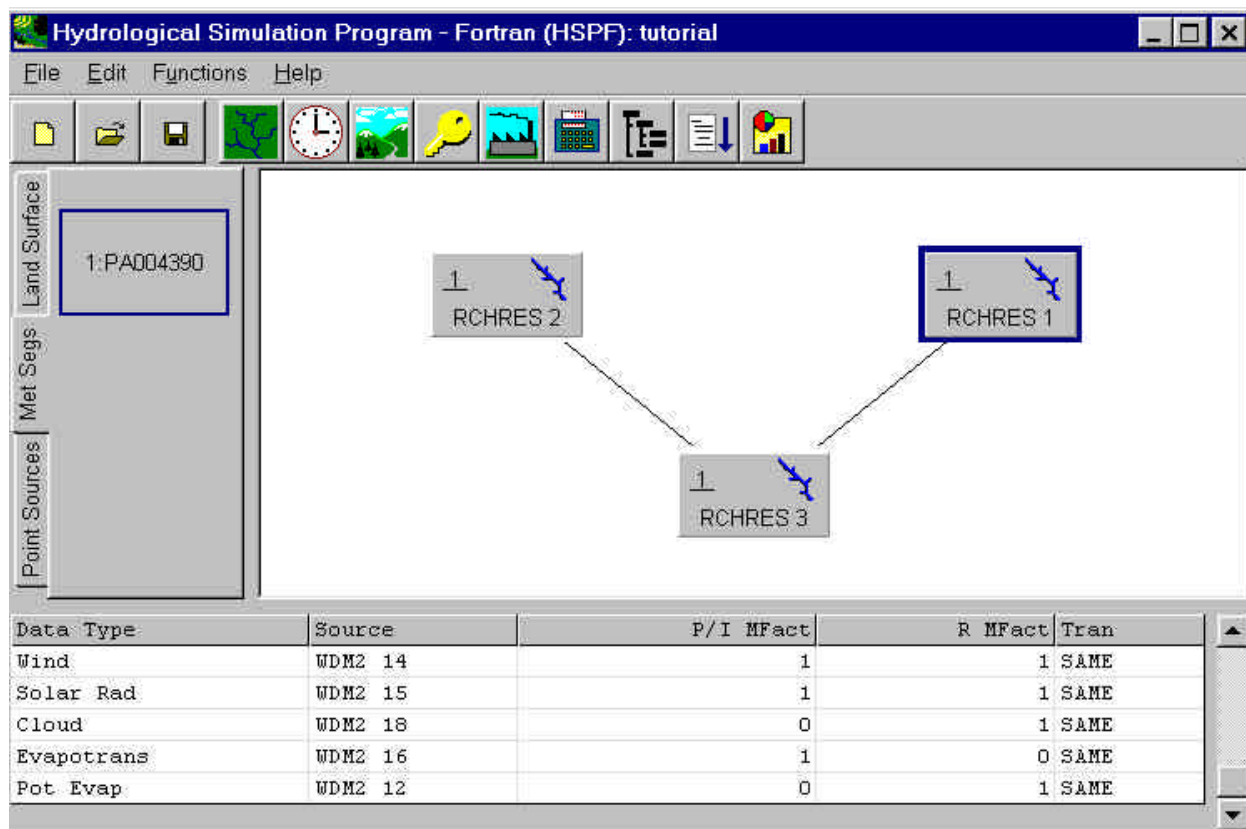
The main window of WinHSPF contains a menu, a tool bar, a vertical tab strip, a schematic of the watershed, and an auxiliary table. The tab strip, watershed schematic, and auxiliary table are not active until a project is active (i.e. a UCI file is opened). The information on the tab strip as well as the auxiliary table pertain to the open project, that is the project represented by the watershed schematic.

The buttons on the tool bar represent various ways of interacting with the open project. The left most buttons can be used for creating, opening, and saving a project. The right most button on the tool bar is used to perform the simulation, i.e. run HSPF. The other buttons on the tool bar are used to view and/or modify the contents of various portions of the open project.

The tab strip contains three tabs. The tabs work in conjunction with the figures in the watershed schematic to display information about the project in the auxiliary table. The tabs are used to specify whether to display information related to land surfaces, met segments, or point sources. Highlighting some items in the tab strip in conjunction with highlighting some figures in the watershed schematic results in some related data being summarized in the auxiliary table. For example, from the **Land Surface** tab, click on the 'Forest Land' surface and the 'Rchres 1' figure. The auxiliary table will show the acres of Forested area contributing to Rchres 1.



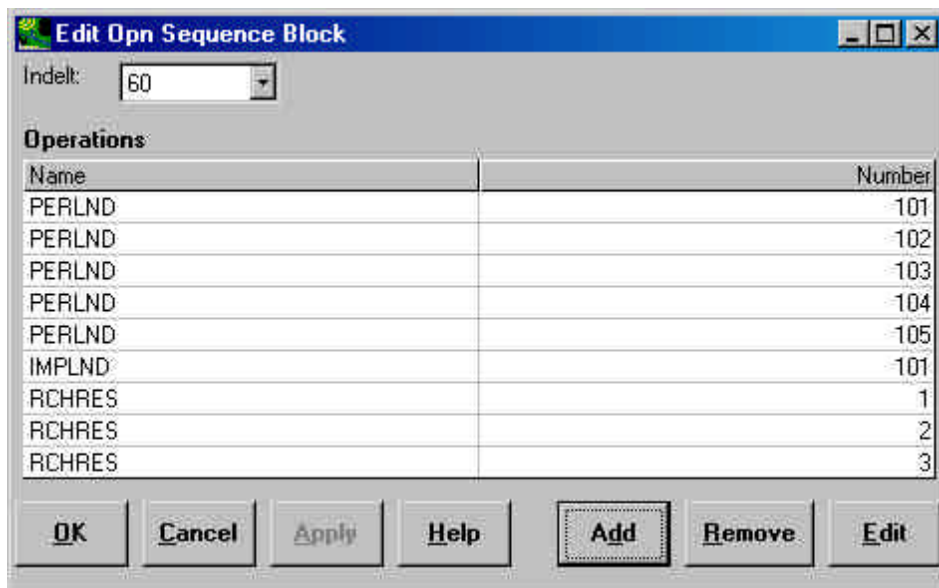
Clicking on the **Met Segs** tab shows which met segments are associated with each reach. The auxiliary table will show information for the selected met segment contributing to the selected reach. Information in the auxiliary table includes the constituent name, WDM data set number, associated multiplication factor for the PERLND/IMPLND segments, associated multiplication factor for the RCHRES segments, and the transformation function used to adjust the time dimension of the data units as necessary.



Similarly, clicking on the **Point Sources** tab shows the point sources that are associated with each reach. The auxiliary table will show information for the selected point source and reach combination.

## Edit Operation

The **Edit Operation** window provides a powerful interface to an HSPF operation. There are two ways to produce this window. One is to select the **OPN SEQUENCE** option from the **Edit** menu, which displays the **Edit Opn Sequence Block** window. Select the desired operation from the Name column then click on the **Edit** button.



The other way to produce the **Edit Operation** window is to double-click on a figure in the watershed schematic or on an item on the **Land Surface** tab of the main form. If the model segmentation is 'Individual', the individual land segments can be accessed by selecting **OPN SEQUENCE** from the **Edit** menu.

The **Edit Operation** window contains a tab strip, a frame containing a row of check boxes, and a series of command buttons. All of the information in the **Edit Operation** window pertains to the current operation, which is referenced in the window name. The tab strip contains tabs for tables, special actions, input timeseries, and output timeseries. Active sections are turned on or off for this operation through use of the row of check boxes. Each of the active sections corresponds to a module within the HSPF model. The user may incorporate these modules into the simulation run by checking the box next to the appropriate section.

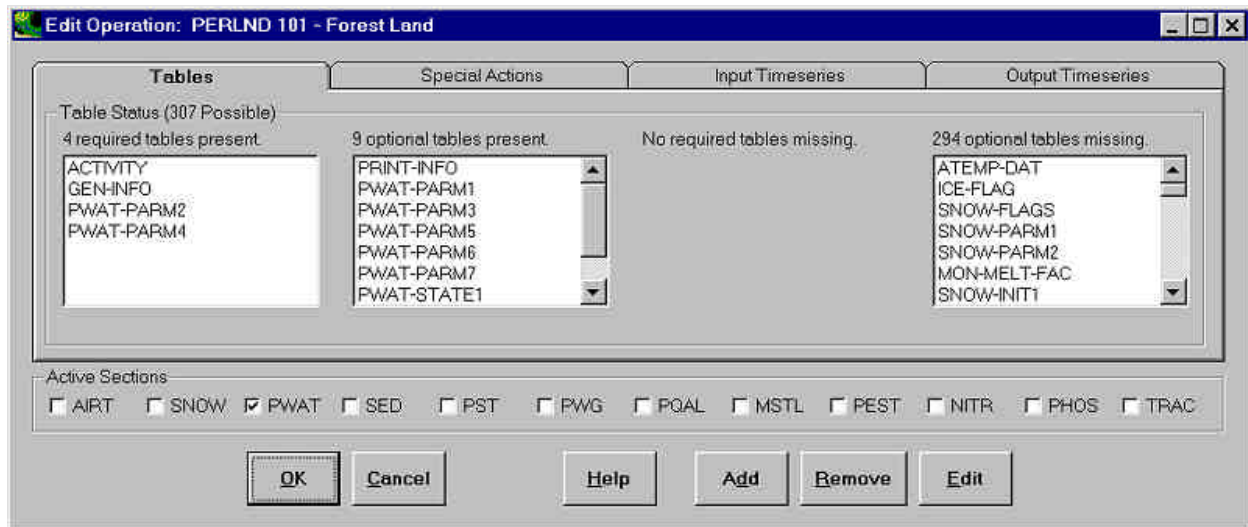
If a **RCHRES** operation is selected, the **Edit Operation** window will appear as follows:



The ten **Active Sections** are:

- HYDR - simulate hydraulic behavior
- AD - prepare to simulate advection of fully entrained constituents
- CONS - simulate conservative constituents
- HT - simulate heat exchange and water temperature
- SED - simulate behavior of inorganic sediment
- GQAL - simulate behavior of generalized quality constituent
- OX - simulate primary DO and BOD balances
- NUT - simulate primary inorganic nitrogen and phosphorus balances
- PLK - simulate zooplankton populations and associated reactions
- PH - simulate pH, carbon dioxide, total inorganic carbon, and Alkalinity

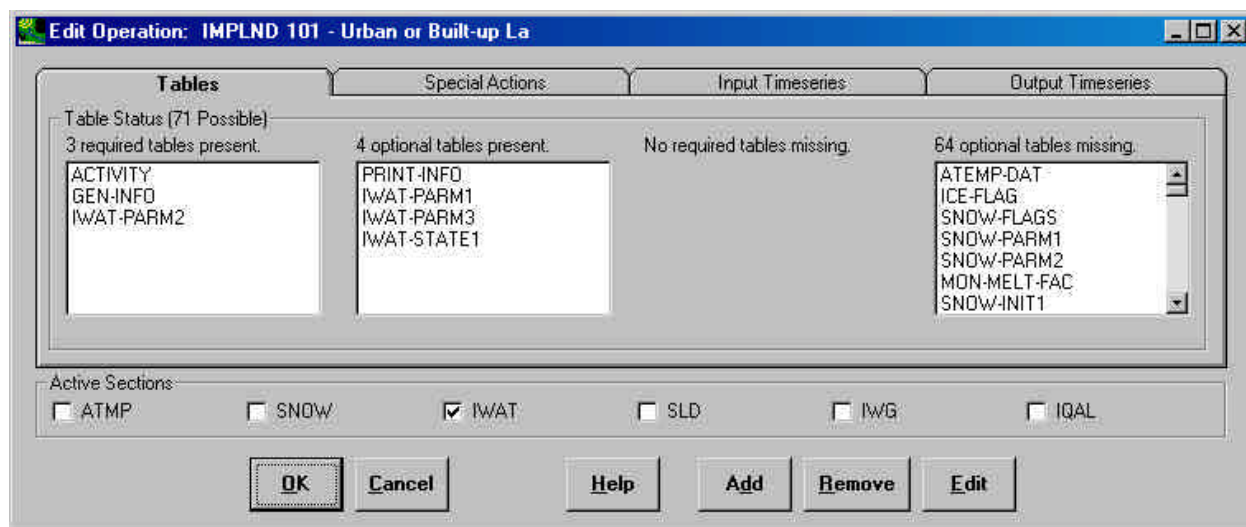
If a PERLND operation is selected, the **Edit Operation** window will appear as follows:



The twelve **Active Sections** are:

- AIRT - temperature correction for elevation difference
- SNOW - simulate accumulation and melting of snow and ice
- PWAT - simulate water budget for a pervious land segment
- SED - simulate production and removal of sediment
- PST - estimate soil temperatures
- PWG - estimate water temperature and dissolved gas concentrations
- PQAL - simulate water quality constituents
- MSTL - estimate moisture content of soil layers and fractional fluxes
- PEST - simulate pesticide behavior in detail
- NITR - simulate nitrogen behavior in detail
- PHOS - simulate phosphorus behavior in detail
- TRAC - simulate movement of a tracer

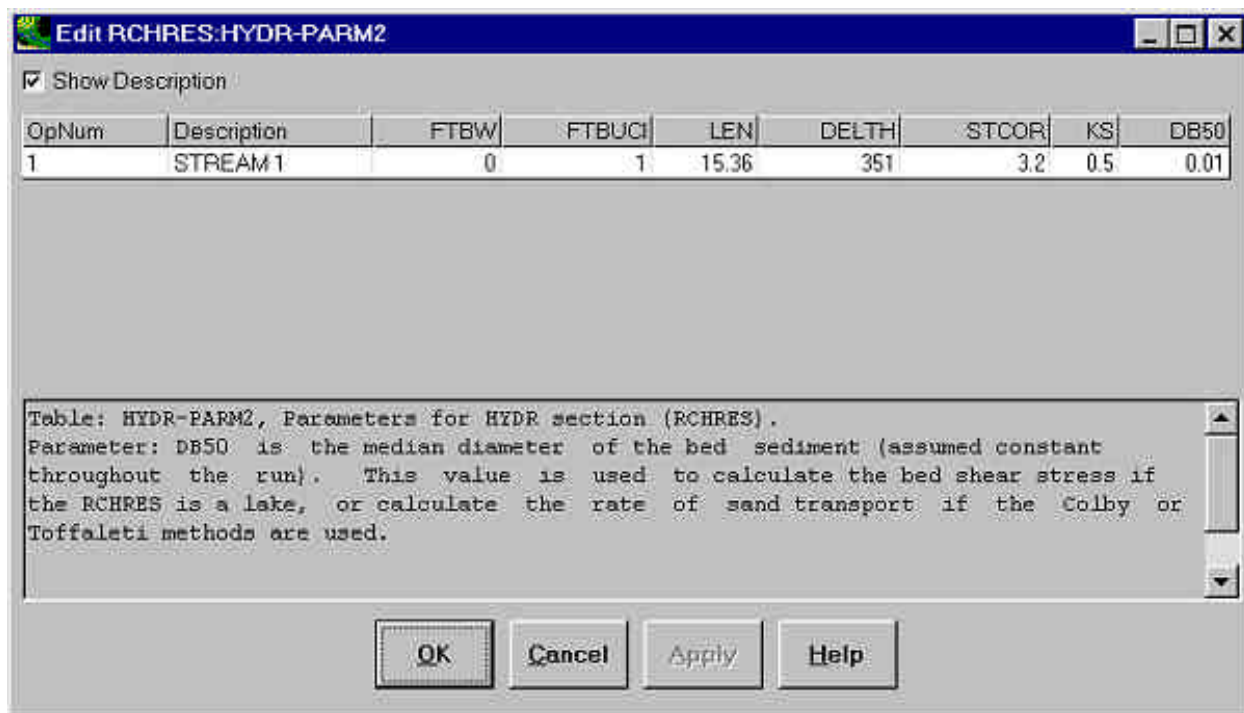
If an IMPLND operation is selected, the **Edit Operation** window will appear as follows:



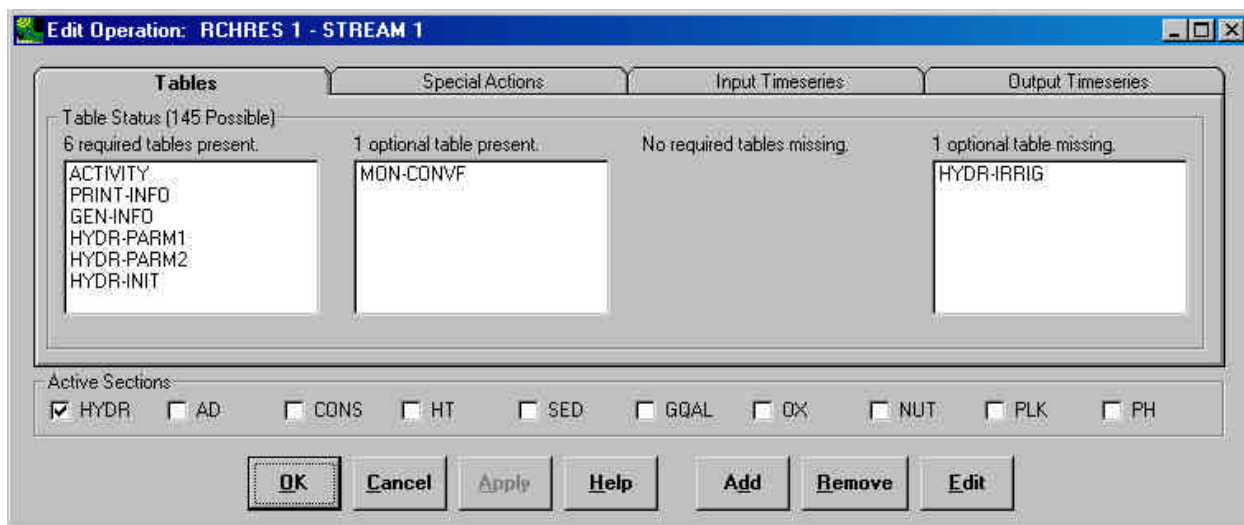
The six **Active Sections** are:

- ATMP - temperature correction for elevation difference
- SNOW - simulate accumulation and melting of snow and ice
- IWAT - simulate water budget for an impervious land segment
- SLD - simulate accumulation and removal of solids
- IWG - estimate water temperature and dissolved gas concentrations
- IQAL - simulate washoff of quality constituents

As active sections are turned on or off, the lists in the **Tables** tab change to reflect the tables applicable to the active sections. The four lists in the **Tables** tab show the required tables that are present, the optional tables that are present, the required tables that are missing, and the optional tables that are missing. The user may add a table by selecting the table name in the list and clicking the **Add** button. The user may remove a table by selecting the table name and clicking the **Remove** button. Similarly, the user may edit a table by selecting the table name and clicking the **Edit** button, or by double-clicking the table name. The resulting **Edit Table** window allows the user to edit the table parameters in a grid.



From this window a user may view and modify which sections of HSPF are active, view and modify the tables present for this operation, and view a summary of input and output timeseries used by this operation. Clicking on a table name allows the user to edit that table. Within this window is encapsulated important HSPF operating logic to assist the user in building a simulation. For example, the information in this window may alert a user to required tables or timeseries that are missing.

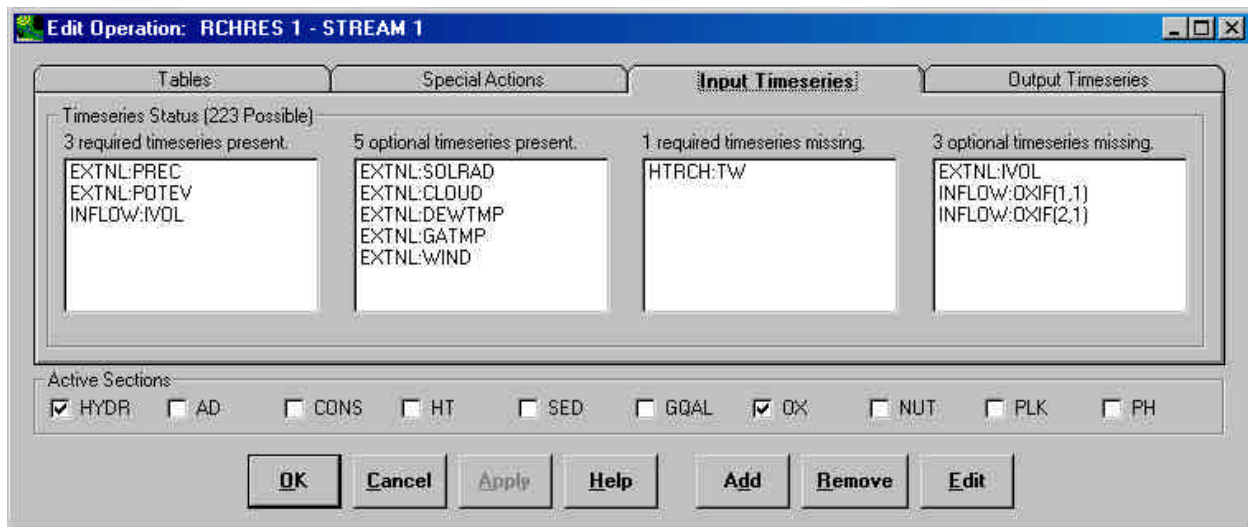


The **Tables** tab is useful for the user to identify which tables are required or missing for the current set of active sections, as well as providing a way to add, remove, and edit tables.



The **Input Timeseries** tab is similar to the **Tables** tab, except that the four lists pertain to Input Timeseries instead of Tables. Input Timeseries are not added and removed using this window as tables are, but the contents of the lists show the user which timeseries are being used in the simulation and which are missing. This functionality is especially useful when adding active sections to a simulation, and might help a user identify problems in a run resulting from required timeseries that are missing.

For example, a user might have only the 'Hydr' section on, and then turn on the 'Ox' section. The information in the **Input Timeseries** tab shows that the required timeseries "HTRCH:TW" is missing. This information would alert the user that the section 'Htrch' should be turned on, or that the timeseries 'HTRCH:TW' should be input as an external source.




The **Output Timeseries** tab is very similar to the **Input Timeseries** tab, except that output timeseries are listed.

The **Special Actions** tab is not yet implemented. When completed, this tab will allow the user to edit the Special Actions specific to this operation. Until this option is completed, the Special Actions can be modified by editing the UCI file in a text editor.

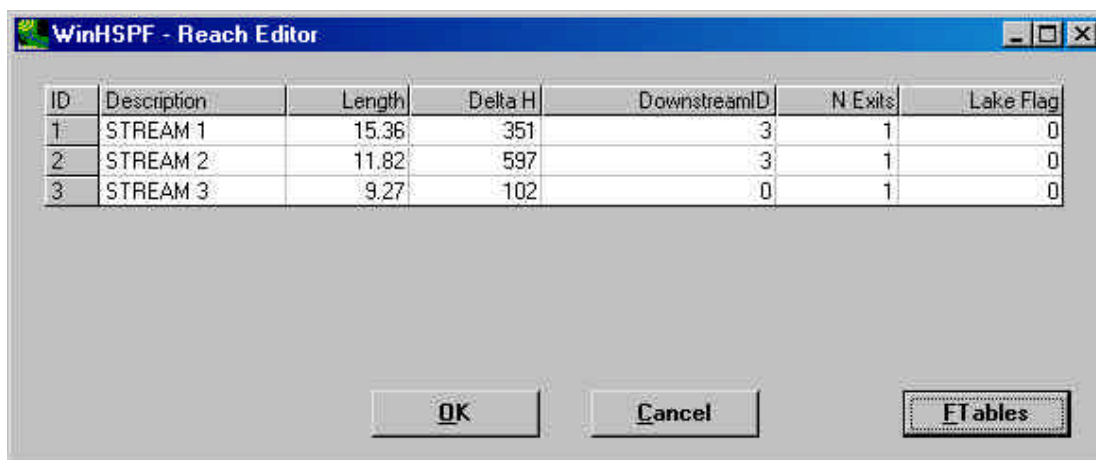


## Reach Editor

The Reach Editor allows the user to edit select properties of each reach. Clicking the  button on the toolbar produces a window containing a grid of values for each reach. Values include:

- ID - RCHRES number as recognized by HSPF
- Description - descriptive name of reach
- Length - length of reach
- Delta H - change in elevation across length of reach
- DownstreamID - RCHRES number of downstream reach
- Nexits - number of outlets from reach
- Lake Flag - value is 1 if rchres is a lake

These values may be edited, and the **OK** button may be clicked to save the changes and return to the main WinHSPF window. The **Cancel** button may be used to return to the main window without saving changes.



Clicking the **FTables** button produces a window from which the user may view and edit the values of each FTable. The drop down list at the top of the window is used to select the desired FTable.

**Edit Ftable**

FTable: 3 - STREAM 3

Depth	Area	Volume	Outflow1
0	154.92	0	0
0.45	155.94	70.55	50.19
4.54	165.12	726.33	2318.94
5.67	180.43	915.14	3360.86
7.09	504.3	1625.92	4257.82
8.51	510.67	2345.73	7770.91
146.09	1129.1	115149.1	2904721
283.68	1747.52	313037.6	1.137729E+07

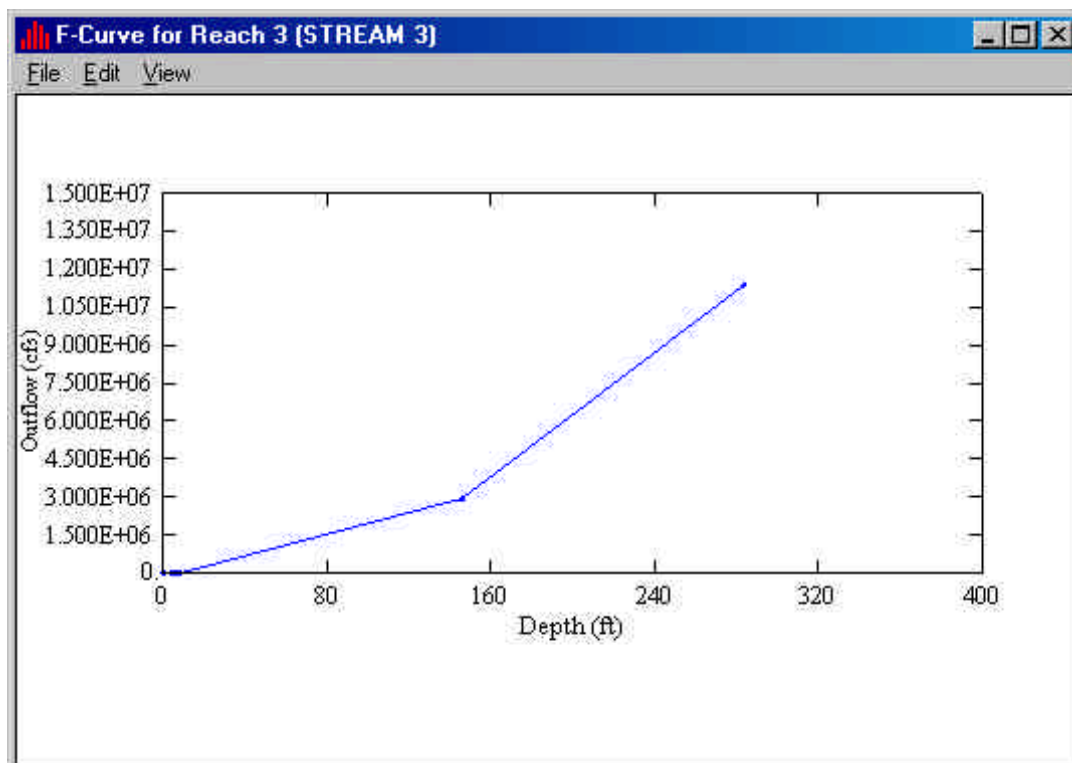
NRows: 8  
NCols: 4

Import From Cross Section

F-Curve

OK Cancel Apply Help

The **FCurve** button produces a graph of the FTable. The features of the graph may be edited by using the menus on the graph.



The **Import From Cross Section** button produces a window from which the user may enter cross section data for an FTable. Clicking **OK** in this form results in a new FTable being calculated for the selected reach.

**Import From Cross-Section**

**Cross-Section Files**

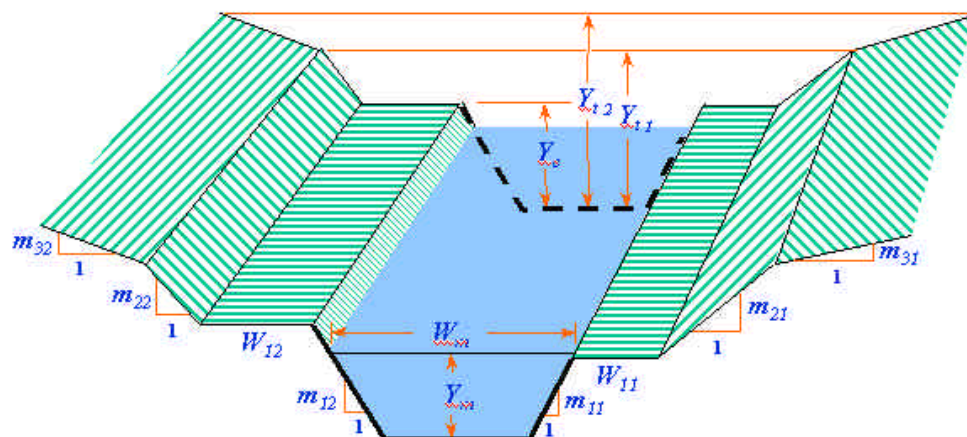
Open  Save

**FTABLE 3**

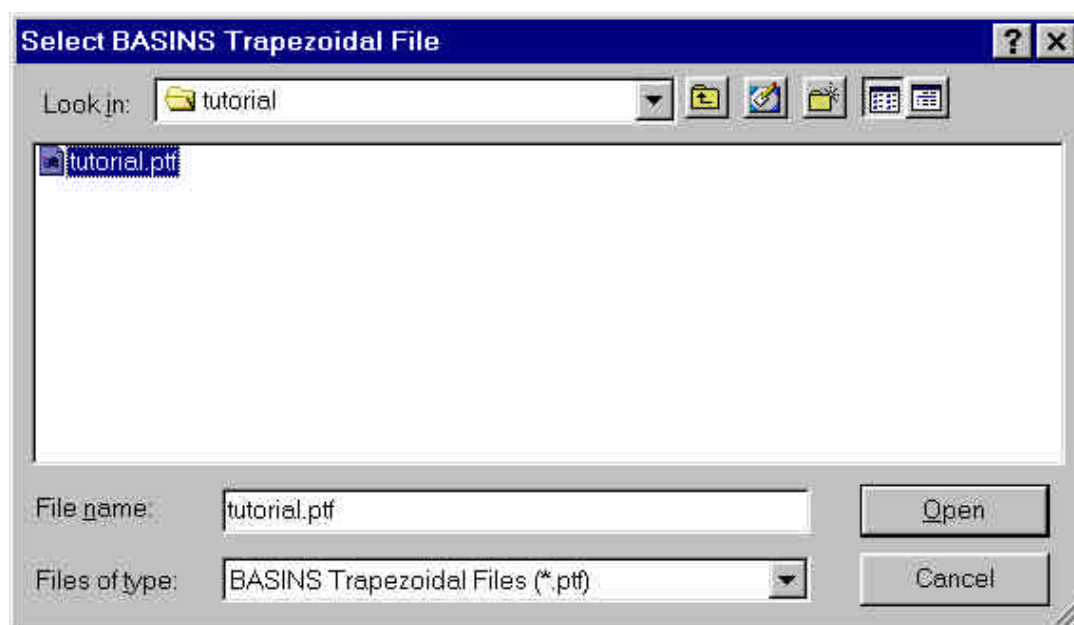
Variable	Description	Value
L	Length (ft)	0.01
Ym	Mean Depth (ft)	0.01
Wm	Mean Width (ft)	0.01
n	Mannings Roughness Coefficient	0.01
S	Longitudinal Slope	0.01
m32	Side Slope of Upper Flood Plain Left	0.01
m22	Side Slope of Lower Flood Plain Left	0.01
W12	Zero Slope Flood Plain Width Left (ft)	0.01
m12	Side Slope of Channel Left	0.01
m11	Side Slope of Channel Right	0.01
W11	Zero Slope Flood Plain Width Right (ft)	0.01
m21	Side Slope Lower Flood Plain Right	0.01
m31	Side Slope Upper Flood Plain Right	0.01
Yc	Channel Depth (ft)	0.01
Y11	Flood Side Slope Change at Depth (ft)	0.01
Y12	Maximum Depth (ft)	0.01

OK Cancel Help


The variables in the Import From Cross-Section frame are defined in following diagram.

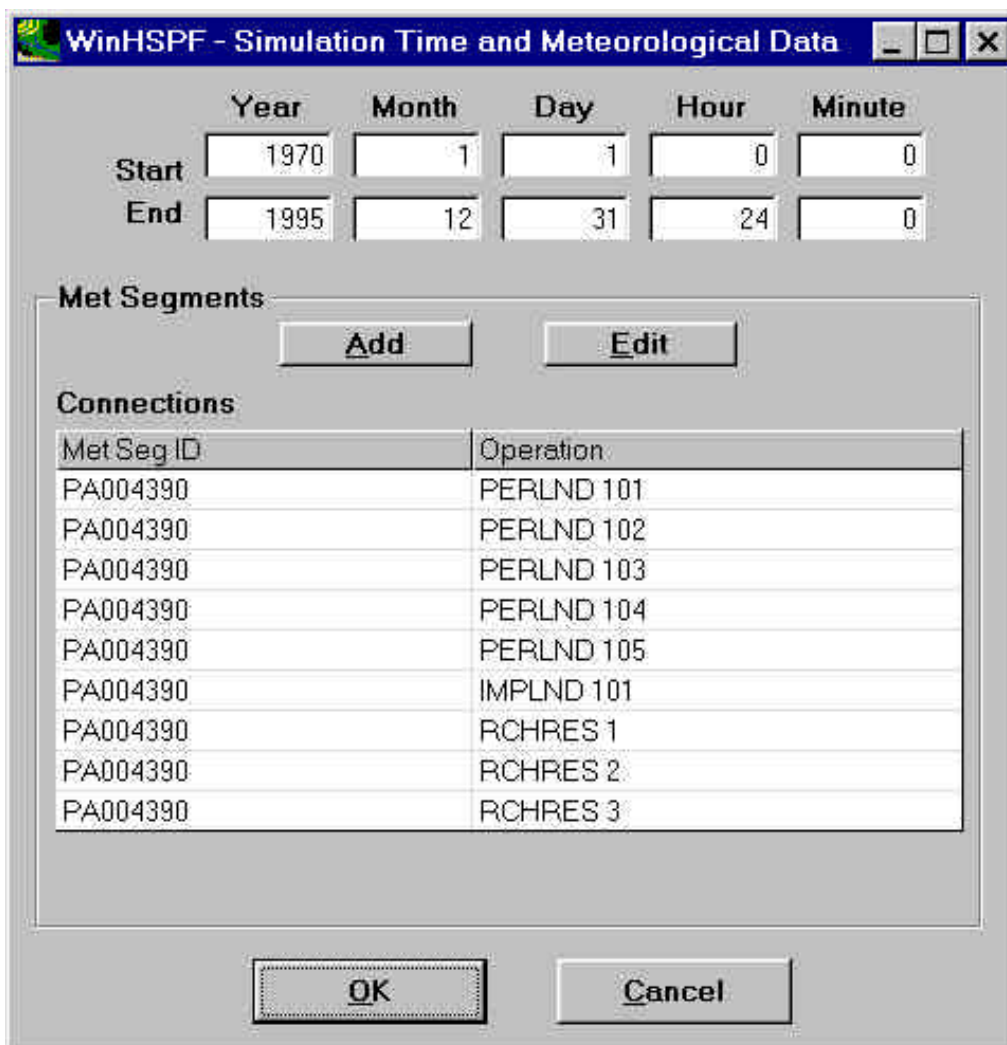


Cross-sectional data can be stored as BASINS Trapezoidal files (\*.rtf). Click the Open button on the Import From Cross-Section frame to open an existing \*.rtf file or the Save button to create a new \*.rtf file.



## Simulation Time

The **Simulation Time** button  on the toolbar produces the **Simulation Time and Meteorological Data** form, which allows the user to edit the simulation starting and ending dates and times, as well as the met segments used in this HSPF project.



The dialog box titled "WinHSPF - Simulation Time and Meteorological Data" contains the following elements:

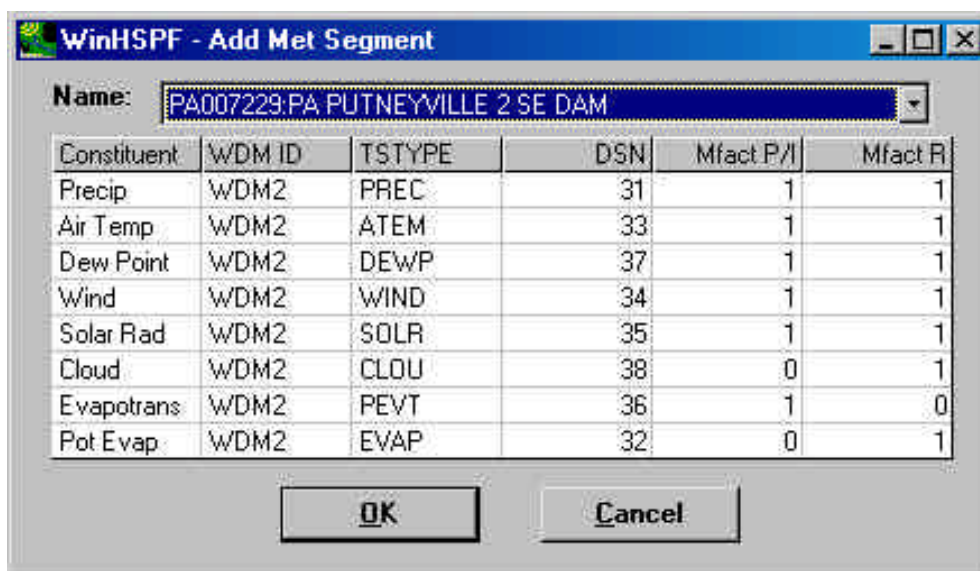
- Start Date/Time:** Year (1970), Month (1), Day (1), Hour (0), Minute (0).
- End Date/Time:** Year (1995), Month (12), Day (31), Hour (24), Minute (0).
- Met Segments:** A section with "Add" and "Edit" buttons.
- Connections:** A table listing meteorological segments and their operations.
- Buttons:** "OK" and "Cancel" buttons at the bottom.

Met Seg ID	Operation
PA004390	PERLND 101
PA004390	PERLND 102
PA004390	PERLND 103
PA004390	PERLND 104
PA004390	PERLND 105
PA004390	IMPLND 101
PA004390	RCHRES 1
PA004390	RCHRES 2
PA004390	RCHRES 3

To edit the dates and times, simply click on the field for the year, month, day, hour, or minute and type in a value.

The Met Segments section of the Simulation Time and Meteorological Data form contains a grid with a list of the meteorological segments and the operations which they affect. New met segments may be added by clicking on the **Add** button. Existing met segments may be modified by clicking on the **Edit** button. To edit a met segment, highlight the desired segment in the Met Seg ID Column then click on the **Edit** button. The **Add Met Segment** and **Edit Met Segment** forms are virtually identical in appearance, except that the Met Segment name in the 'Add Met Segment' form may be chosen from a drop-down list.

The precipitation data set defines the met segment and thus may not be edited in the **Edit Met Segment** form.

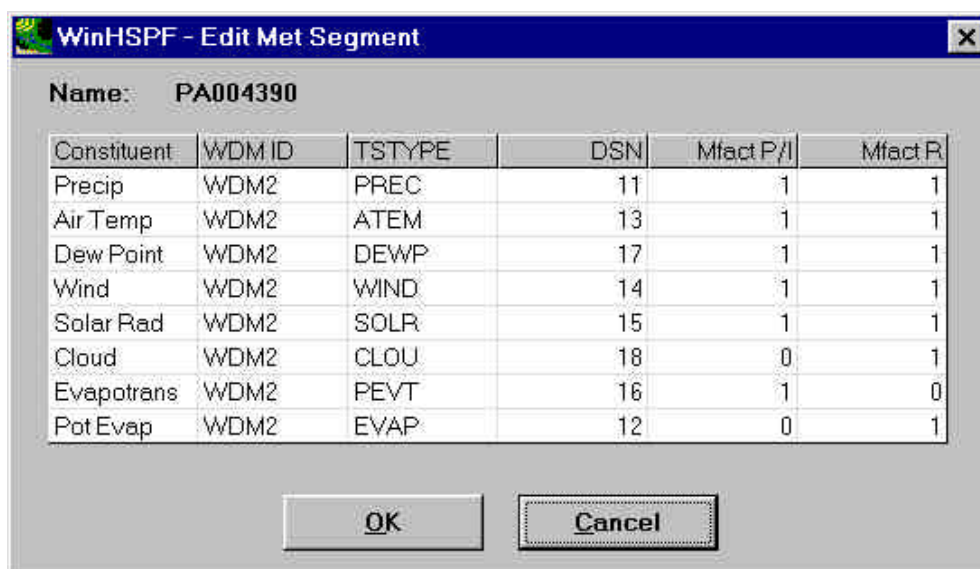


**WinHSPF - Add Met Segment**

Name: PA007229:PA PUTNEYVILLE 2 SE DAM

Constituent	WDM ID	TSTYPE	DSN	Mfact P/I	Mfact R
Precip	WDM2	PREC	31	1	1
Air Temp	WDM2	ATEM	33	1	1
Dew Point	WDM2	DEWP	37	1	1
Wind	WDM2	WIND	34	1	1
Solar Rad	WDM2	SOLR	35	1	1
Cloud	WDM2	CLOU	38	0	1
Evapotrans	WDM2	PEVT	36	1	0
Pot Evap	WDM2	EVAP	32	0	1

OK Cancel



**WinHSPF - Edit Met Segment**

Name: PA004390

Constituent	WDM ID	TSTYPE	DSN	Mfact P/I	Mfact R
Precip	WDM2	PREC	11	1	1
Air Temp	WDM2	ATEM	13	1	1
Dew Point	WDM2	DEWP	17	1	1
Wind	WDM2	WIND	14	1	1
Solar Rad	WDM2	SOLR	15	1	1
Cloud	WDM2	CLOU	18	0	1
Evapotrans	WDM2	PEVT	16	1	0
Pot Evap	WDM2	EVAP	12	0	1

OK Cancel

The eight constituents listed in the first column of the grid constitute a full set of data for a met segment. The next three columns contain drop-down listboxes with all available selections for each column. These columns should be filled out left to right because each successive field is dependent on the previous. The WDM ID column lists the WDM files used by this project (there may be up to 4). The TSTYPE column lists the types of time series available for the selected WDM file. The DSN column lists the data set numbers of the time series available for the selected WDM file and time series type. A real number should be typed in for the final 2 columns, which contain multiplication factors to be applied to the PERLND/IMPLND operations and to the RCHRES operations.

Values may be entered in the grid one at a time or they may be copied from an existing grid en masse. To copy values from one grid to another:

- bring up a full grid using the **Edit** button
- highlight the block of values to be copied
- type 'ctrl-c' to copy
- bring up an empty grid using the **Add** button or another full grid using the **Edit** button
- highlight the complete portion of the second grid where the values are to be pasted
- type 'ctrl-v' to paste

Once the desired changes have been made via the **Simulation Time and Meteorological Data** form, the **OK** button may be clicked to save the changes and return to the main WinHSPF window. The **Cancel** button may be used to return to the main window without saving changes.